

More than the usual amount of fog was reported. Near the Banks of Newfoundland fog was reported on 26 dates; between the 55th and 65th meridians on 18 dates; and west of the 65th meridian on 17 dates. Compared with the corresponding month of the last 4 years the dates of occurrence of fog east of the 55th meridian numbered 3 greater than

the average; between the 55th and 65th meridians 4 greater than the average; and west of the 65th meridian 8 greater than the average. The fog noted by shipmasters and that reported by observers of the Weather Bureau on the New England and middle Atlantic coasts generally attended the advance or passage of general storms.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for July, 1892, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average for the several districts. The normal for any district may be found by adding the departure to the current mean when the temperature is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in the Gila and lower Colorado valleys, where it was above 95, and the mean readings were above 85 in adjoining parts of Arizona and southern California, and in the lower Rio Grande valley. Over the Florida Peninsula, along the South Carolina, Georgia, and Gulf coasts, in Louisiana, Texas, and Indian and Oklahoma territories, over the southwestern plateau region, and in southeastern California the mean values were above 80. The mean temperature was lowest along the immediate Pacific coast north of San Francisco, Cal., where it was below 55, and it was below 60 in Calgary, in the mountains of central Colorado, in the lower Saint Lawrence valley, and at Yarmouth, N. S.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for July for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for July, 1892; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for July during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of July.	(2) Length of record.	(3) Mean for July, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for July.			
					Highest.	Year.	Lowest.	Year.
<i>Arizona.</i>	°	Years	°	°	°		°	
Fort Apache.....	75.7	20	74.8	- 0.9	83.6	1877	70.3	1883
Fort Mohave.....	95.5	21	93.1	- 2.4	100.1	1873	90.1	1888
Whipple Barracks.....	75.3	21	73.9	- 1.4	81.7	1878	70.4	1883, 1891
<i>Arkansas.</i>								
Lead Hill.....	81.3	10	.....	.....	84.2	1888	75.2	1882
<i>California.</i>								
Fort Bidwell.....	71.6	21	66.9	- 4.7	75.9	1874	63.9	1884
Riverside.....	77.3	10	.....	.....	79.4	1883	75.9	1889
<i>Colorado.</i>								
Las Animas.....	75.7	9	76.0	+ 0.3	79.1	1890	73.0	1891
<i>Florida.</i>								
Merritts Island.....	80.7	10	81.3	+ 0.6	82.8	1891	78.5	1886
<i>Georgia.</i>								
Forsyth.....	81.9	18	79.2	- 2.7	85.7	1881	78.3	1882
<i>Idaho.</i>								
Boise Barracks.....	74.0	18	70.3	- 3.7	79.6	1873	69.4	1884
Fort Sherman.....	67.3	8	65.3	- 2.0	74.2	1889	62.6	1884
<i>Illinois.</i>								
Centralia.....	79.0	11	.....	.....	88.0	1887	73.0	1882
<i>Indiana.</i>								
Lafayette.....	73.4	10	73.9	+ 0.5	79.8	1887	69.0	1882
<i>Indian Territory.</i>								
Fort Supply.....	80.6	13	79.6	- 1.0	85.8	1874	76.4	1891
<i>Iowa.</i>								
Cresco.....	70.9	19	69.6	- 1.3	75.2	1874	65.1	1891

Deviations from normal temperature—Continued.

State and station.	(1) Normal for the month of July.	(2) Length of record.	(3) Mean for July, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for July.			
					Highest.	Year.	Lowest.	Year.
<i>Kansas.</i>	°	Years	°	°	°		°	
Eureka Ranch.....	81.4	9	76.6	- 4.8	86.2	1890	76.3	1891
Independence.....	79.5	20	79.7	+ 0.2	85.9	1879	74.7	1891
Salina.....	81.3	9	79.0	- 2.3	86.3	1890	76.2	1891
<i>Louisiana.</i>								
Grand Coteau.....	82.5	7	79.0	- 3.5	85.4	1884	79.0	1892
<i>Maine.</i>								
Orono.....	66.9	22	68.6	+ 1.7	71.0	1887	64.2	1884
<i>Maryland.</i>								
Cumberland.....	72.1	21	72.9	+ 0.8	77.7	1889	70.3	1888
<i>Michigan.</i>								
Kalamazoo.....	72.2	15	72.6	+ 0.4	77.8	1885	67.2	1891
<i>Missouri.</i>								
Sedalia.....	78.6	12	76.5	- 2.1	82.8	1888	71.2	1891
<i>Montana.</i>								
Fort Custer.....	70.7	11	.....	.....	74.2	1890	67.8	1884
<i>Nebraska.</i>								
Fort Robinson.....	72.8	9	71.7	- 1.1	78.1	1886	66.9	1891
Genoa (near).....	74.7	16	74.0	- 0.7	78.6	1890	69.8	1891
<i>Nevada.</i>								
Browns.....	83.5	20	84.1	+ 0.6	89.1	1873	79.4	1881
Carson City.....	71.5	14	68.9	- 2.6	73.7	1875	68.9	1892
<i>New Hampshire.</i>								
Hanover.....	69.3	20	67.4	- 1.9	72.1	1878	66.7	1884
<i>New Mexico.</i>								
Deming.....	86.1	10	90.6	+ 4.5	90.6	1892	80.7	1890
Fort Wingate.....	73.3	21	70.4	- 2.9	77.8	1873	68.1	1888
<i>New York.</i>								
Cooperstown.....	68.3	21	66.6	- 1.7	73.0	1887	64.5	1884
Plattsburg Barracks.....	69.6	20	68.8	- 0.8	73.2	1887	65.2	1891
<i>North Carolina.</i>								
Lenoir.....	74.5	19	72.9	- 1.6	77.7	1877	66.4	1884
<i>Oklahoma.</i>								
Fort Reno.....	80.8	9	79.8	- 1.0	84.9	1887	76.2	1891
Fort Sill.....	82.3	21	80.0	- 2.3	86.0	1871	77.2	1880
<i>Oregon.</i>								
Bandon.....	57.7	8	57.0	- 0.7	59.5	1888	54.6	1887
Eola.....	64.6	21	60.7	- 3.9	70.3	1889	59.6	1888
<i>Pennsylvania.</i>								
Dyberry.....	67.9	19	66.6	- 1.3	72.6	1887	63.0	1891
Grampian Hills.....	70.5	21	70.3	- 0.2	76.8	1887	65.4	1891
Wellsboro.....	69.4	13	64.5	- 4.9	76.1	1881	60.4	1891
<i>South Carolina.</i>								
Statesburg.....	78.3	11	76.4	- 1.9	84.0	1881	74.6	1891
<i>South Dakota.</i>								
Fort Sully.....	74.8	21	75.4	+ 0.6	80.2	1871	70.9	1884
<i>Texas.</i>								
Austin.....	84.0	19	84.5	+ 0.5	88.3	1879, 1884	82.0	1877
Silver Falls.....	80.1	6	81.6	+ 1.5	83.9	1888	74.6	1887
<i>Utah.</i>								
Terrace.....	82.0	17	83.5	+ 1.5	89.3	1874	77.6	1875
<i>Vermont.</i>								
Stratford.....	69.2	19	68.4	- 0.8	73.5	1887	65.7	1891
<i>Virginia.</i>								
Dale Enterprise.....	75.8	12	75.3	- 0.5	83.0	1887	71.5	1884
<i>Washington.</i>								
Fort Townsend.....	61.6	18	58.4	- 3.2	66.1	1875	58.4	1892
<i>West Virginia.</i>								
Parkersburg.....	78.1	11	72.2	- 5.9	87.0	1881	68.9	1886
<i>Wisconsin.</i>								
Embarrass.....	71.0	21	70.4	- 0.6	74.7	1874	65.5	1891
Madison.....	71.8	17	71.6	- 0.2	75.2	1885	66.6	1891
<i>Wyoming.</i>								
Fort Washakie.....	69.6	7	67.7	- 1.9	73.7	1886	65.4	1891

DEPARTURES FROM NORMAL TEMPERATURE.

The mean temperature was below the normal, except along the northern border of the country east of the 110th meridian, in New England, eastern New York, and eastern Pennsylvania, and over east parts of the middle and southern plateau regions. The most marked departure below the normal temperature was noted in North Carolina, South Carolina, at Vicksburg, Miss., and in the valley of the Columbia River, where it was more than 3, and the mean temperature was 2 to 3 lower than usual generally east of the Mississippi and south of the Ohio rivers, in Washington and Oregon, and along the

south Pacific coast. The greatest departure above the normal temperature was noted along the west coast of the Gulf of Saint Lawrence, where it exceeded 3, and the temperature was 2 higher than the average for the month over the northern lake region, and in the British Possessions north of North Dakota and eastern Montana. Over the east part of the middle and southern plateau regions the excess in temperature was slight.

YEARS OF HIGHEST MEAN TEMPERATURE FOR JULY.

At Eastport, Me., Deming, N. Mex., and Tucson, Ariz., the mean temperature for the current month was the highest on record for July. The highest mean temperature on record for July was noted on the south Pacific coast and in the Sacramento Valley in 1891; in the middle Mississippi and Ohio valleys and the lower lake region in 1887; and in the upper lake region in 1878.

YEARS OF LOWEST MEAN TEMPERATURE FOR JULY.

At Southport, N. C., Key West, Fla., Grand Coteau, La., Galveston, Tex., Carson City, Nev., and Walla Walla and Fort Townsend, Wash., the mean temperature for the current month was the lowest on record for July. The lowest mean temperature for July occurred generally in the central valleys, the Lake region, and Atlantic coast states north of the 35th parallel in 1892, and in the upper Missouri valley in 1884.

MAXIMUM TEMPERATURE.

At Eastport, Me., Block Island, R. I., New Haven, Conn., Philadelphia, Pa., Grand Haven, Mich., and Concordia, Kans., the maximum temperature for the current month was the highest ever noted for July. These high temperatures occurred during the warm weather of the latter part of the month, and, with the exception of Block Island and Concordia, were recorded on the 26th.

The highest mean temperature recorded at a regular station of the Weather Bureau was 112, at Yuma, Ariz., on the 1st. The temperature rose to 110 at Fresno, Cal., and was above 100 in areas in the middle Atlantic states, in a large area extending from northwestern Texas to the western Dakotas and eastern Montana, in the upper valley of the Columbia River, over the southern and southwestern plateau regions, and in the central valleys of California. The highest temperature reported by a voluntary observer was 120 in the Colorado Desert, Cal., and these reports show maximum temperature above 100 in all sections of the country, except New England, New York, the northern lake region, and along the Pacific coast. The lowest maximum temperature was noted along the immediate Pacific coast north of the 40th parallel, where it was below 70, and the maximum values were below 80 on the southeast New England coast.

MINIMUM TEMPERATURE.

At Lynchburg and Norfolk, Va., Kittyhawk, N. C., Charleston, S. C., Jacksonville, Fla., New Orleans, La., Cleveland, Sandusky, and Toledo, Ohio, Keokuk, Iowa, Leavenworth, Kans., Abilene, Tex., Fort Stanton, N. Mex., Havre, Mont., and Walla Walla, Wash., the minimum temperature for the current month was as low or lower than previously reported for July.

The lowest temperature reported by a regular station of the Weather Bureau in July, 1892, was 31 at Havre, Mont., on the 28th. The minimum fell to 37 at Baker City, Oregon, on the 23d, and to 38 at Northfield, Vt., on the 5th. Reports of voluntary observers show temperature below the freezing point at stations in North Dakota, New Mexico, and the eastern plateau region. The highest minimum temperature was noted over the southern half of the Florida Peninsula and along the west Gulf coast, where it was above 70, and the minimum readings were above 60 in the Southern States, in Arizona, and southeastern California.

RANGES OF TEMPERATURE.

The greatest daily ranges of temperature are shown in the table of miscellaneous meteorological data. The greatest

monthly ranges of temperature occurred over northern Montana and eastern Oregon, where they exceeded 60. From that region the monthly ranges decreased eastward to less than 40 along the immediate New England and middle Atlantic coasts, southeastward to less than 20 over southern Florida and along the west Gulf coast, southward to less than 40 over the southern plateau region, and westward to less than 20 along the immediate Pacific coast.

PERIODS OF HIGH TEMPERATURE.

The highest temperature of the month was noted in Arizona on the 1st, a maximum of 112 and 106 being noted at Yuma and Tucson, respectively. In the Sacramento Valley the temperature rose to 105, and at the evening report was 10 above the normal. This warm wave extended over the northeast slope of the Rocky Mountains during the 2d, reached the middle Missouri and extreme upper Mississippi valleys on the 3d, extended over the Ohio Valley and the eastern lake region during the 4th, and the New England states by the 5th, without causing marked temperature changes in the middle and south Atlantic states.

A marked rise in temperature occurred in the Pacific coast states on the 7th. During the 8th the warm wave extended over the northern part of the country to the Lake Superior region, and the highest temperature of the month, 89, was noted at Roseburg, Oregon. On the 9th the temperature rose in the Southwest, and on the 10th the warmer weather reached the Atlantic coast. On the 10th the temperature rose 10 to 12 over the Dakotas and Nebraska, and on the 11th the highest temperature of the month occurred in the Dakotas and western Minnesota. This warm wave reached the Atlantic coast states the night of the 12th.

On the 12th and 13th the temperature rose from the middle and southern plateau regions over the Dakotas, and on the 14th the highest temperature of the month, 100, was noted at Pueblo, Colo. On the 18th the temperature rose decidedly over the plateau region and thence to the middle Missouri valley, the warm wave extended over the Ohio Valley and the Lake region during the 19th, with temperature 10 to 17 above the normal in the western lake region, and reached the Atlantic coast on the 20th.

Unusually warm weather prevailed generally east of the Rocky Mountains from the 21st to 28th. The high temperature of this period was caused, not by well-marked warm waves from the West, but by continued southerly winds due to the distribution of atmospheric pressure, which was persistently low in the Northwest and high in the Southeast. A discussion of this warm period, together with the high temperature of the early part of August, will appear in the August, 1892, REVIEW.

PERIODS OF LOW TEMPERATURE.

The month opened with temperature 10 to 15 below the normal from the middle Atlantic and New England coasts over the middle Mississippi valley. On the 1st the temperature fell 10 to 20 over Montana. This cool wave extended over the middle-eastern slope of the Rocky Mountains during the 2d, with the lowest temperature of the month over the eastern part of the middle plateau region; there was also a decided fall in temperature in the upper lake region. By the night of the 3d the cool wave reached the Atlantic coast, with temperature 10 to 15 below the normal in the Ohio Valley and lower lake region, and the cooler weather extended over the Southern States during the 4th.

On the 5th the temperature fell 5 to 10 over the northern plateau region, and the lowest temperature of the month, 47, was noted at Portland, Oregon. During the 6th the cool wave overspread the plateau region and the northeast slope of the Rocky Mountains, and on the 7th reached the middle-eastern slope of the Rocky Mountains and the western Lake Superior region. The influence of this cool wave did not extend east of the Mississippi River. During the 9th and 10th a cool wave extended eastward from the Pacific coast and occupied

the western part of the middle plateau region the night of the 10th, with temperature 15 to 20 below the normal. On the 11th a fall of 20 occurred in the upper Missouri valley, and on the 12th the cool wave covered an area extending from Lake Superior to New Mexico. During the 13th the cooler weather extended over the Lake region and the Ohio Valley, and a slight fall in temperature occurred in the middle Atlantic and New England states.

A fall of 10 to 20 in temperature was shown in Alberta the morning of the 14th. On the 15th a marked fall in temperature occurred from the upper lake region to New Mexico, on the 16th the cool wave reached the Atlantic coast, and the lowest temperature of the month was noted at points in the middle Atlantic and New England states and the lower lake region on the 17th. During the 16th a cool wave overspread the plateau region and extended thence over the Northwest during the 17th. On the 20th a marked fall in temperature occurred in the upper Mississippi valley and the temperature continued cool in that region until the 21st. From the 22d to the 24th a cool wave advanced from Montana over the upper lake region.

On the 26th the temperature fell 10 to 20 in Montana and was more than 20 below the normal. This cool wave extended over the Missouri Valley during the 27th, with temperature 20 to 30 below the normal over South Dakota and Nebraska. On the 28th a cool wave occupied the western lake region and districts to the southwest, and the night of the 29th reached the middle Atlantic and New England coasts, ending the

period of high temperature which had prevailed in that region after the 21st.

TEMPERATURE, JANUARY TO JULY, INCLUSIVE.

For the period January to July, inclusive, the temperature averaged about normal in the middle Atlantic states, the Lake region, the extreme northwest, on the southeast slope of the Rocky Mountains, over the northern plateau region, and on the north Pacific coast. In New England and over the middle plateau region the mean was about 1 above the normal, and in the south Atlantic and east Gulf states, at Key West, Fla., in the Ohio Valley and Tennessee, the upper Mississippi and Missouri valleys, on the northeast and middle-eastern slopes of the Rocky Mountains, over the southern plateau region, and along the middle and southern Pacific coasts the mean was 1 to 2 below the normal temperature for the period named.

FROST.

Light frost was reported in the interior of New York on the 2d and 17th; in the interior of Pennsylvania on the 18th; in eastern Upper Michigan on the 16th; at points in North Dakota on the 3d, 28th, and 29th; in South Dakota on the 15th; and in Nebraska on the 28th. At Havre, Mont., a heavy frost occurred the morning of the 28th, damaging garden vegetables and corn. Light frost was reported in Utah from the 27th to the 31st; about Carson City, Nev., on the 11th; in northeastern Nevada on the 11th, 12th, 14th, and 24th; at Baker City, Oregon, on the 7th; in southeastern Washington on the 7th, 8th, 10th, 13th, 14th, and 23d; and at Olympia, Wash., on the 7th.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for July, 1892, as determined from the reports of about 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The precipitation for July is usually greatest along the east Gulf and west Florida Peninsula coasts, where it exceeds 8.00, and the normal amount exceeds 6.00 along the Carolina coast, and in areas in adjoining parts of western Missouri and western Arkansas, and in southeastern Kansas. Over the greater part of the country east of the Mississippi River, and in large areas between the Mississippi River and the Rocky Mountains the average precipitation for July is 4.00 to 6.00. The greater part of California is practically rainless in July, and less than 1.00 is commonly recorded over the west part of the plateau region and along the Pacific coast south of Washington.

In July, 1892, the monthly precipitation was greatest in the middle and east Gulf states, where it generally exceeded 10.00, and in areas in that region it amounted to 15.00 and 20.00. The monthly amount was also in excess of 10.00 in small areas in the south Atlantic states, Tennessee, and the upper Mississippi valley. The monthly precipitation was 6.00 to 8.00 over the greater part of the country east of the Mississippi and south of the Ohio rivers, and in considerable areas in the middle and upper Mississippi valleys. In California and over the west parts of the middle and southern plateau regions little or no precipitation was reported, and less than 2.00 fell generally over the Rocky Mountain and plateau regions and in the Pacific coast states, save along the immediate north Pacific coast, where more than 2.00 was recorded.

DEPARTURES FROM NORMAL PRECIPITATION.

The monthly precipitation was in excess of the average

amount for July in the east Gulf states, along the Atlantic coast from Florida to Maryland, in the upper Mississippi and upper Missouri valleys, and along the immediate north Pacific coast. The greatest excess in precipitation occurred in Alabama and Mississippi, where it was 4.00 to 8.00; the excess was more than 4.00 in central Iowa and eastern Minnesota, and was more than 2.00 along the Carolina coast, in Virginia, and northwest North Dakota. In New England and the Canadian Maritime Provinces, southeastern New York, eastern Pennsylvania, the western lake region, in the middle Missouri valley and the Southwest, and generally over the Rocky Mountain and plateau regions and on the Pacific coast, except at Helena, Mont., and along the Washington coast, the monthly precipitation was deficient, the most marked deficiency being noted in Nova Scotia, at Eastport Me., New York, N. Y., Milwaukee, Wis., over the Florida Peninsula, and in eastern South Dakota, where it was more than 2.00.

Considered by districts the monthly precipitation averaged about normal in the middle and south Atlantic states, the lower lake region, on the northeast slope of the Rocky Mountains, over the middle plateau region, and along the middle and south Pacific coasts. In districts where the monthly precipitation was in excess the average percentage of the normal was about as follows: East Gulf states, 171; upper Mississippi valley, 148; northern plateau, 133; extreme northwest, 128; north Pacific coast, 116; and Ohio Valley and Tennessee, 115. In districts where the precipitation was deficient the percentage of the normal was about as follows: Key West, Fla., 38; southern plateau, 48; New England, 53; west Gulf states, 54; middle-eastern slope of the Rocky Mountains, 63; Missouri Valley, 67; upper lake region, 69; southeast slope of the Rocky Mountains, 84.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for July for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for July, 1892; (4) the departure of the current month from